City of Santa Clara
Building Division
1500 Warburton Ave.
Santa Clara, CA 95050
www.santaclaraca.gov

Building Division: 408-615-2440
Email: Building@santaclaraca.gov
Permit Center: 408-615-2420
Email: PermitCenter@santaclaraca.gov
Automated Inspection Scheduling System: 408-615-2400

# 2016 CALIFORNIA ENERGY CODE
# RESIDENTIAL INDOOR QUALITY & MECHANICAL VENTILATION

*Under ASHRAE 62.2-2010, there are several prescriptive methods of how to meet the Local Exhaust and Whole-Building Ventilation requirements. This summary guide will only discuss the simplest methods of Prescriptive Approach for meeting the ANSI/ASHRAE 62.2-2010 requirements, which contractors will most likely use to meet these requirements as required by the 2016 Building Energy Efficiency Standards.*

**Code Requirements** (2016 California Energy Efficiency Standards and ASHRAE 62.2-2010)
The 2016 California Energy Efficiency Standards requires that low-rise residential buildings to meet the requirements of ASHRAE Standard 62.2-2010 for "Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings". The ASHRAE standards are a separate document; however, the Residential Compliance Manual has an extensive discussion on this subject in section 4.6

**1) When Required?**

It is mandated for all newly-constructed low-rise residential buildings (up to 3 stories) and additions greater than 1,000 square feet (original building must also comply).

**2) Local Exhaust Ventilation in Bathroom and Kitchen**

- Each bathroom is required to have an exhaust fan ducted to the outside with 50 cfm minimum if operated intermittently OR 20 cfm if continuously operated. Bathroom is any room with a bathtub, shower, spa or similar sources of moisture. Toilet room is not considered a bathroom.
- Each kitchen is required to have an exhaust fan ducted to the outside with 100 cfm minimum if operated intermittently OR 5 air change per hour of kitchen volume if continuously operated. *The range hood over the stove may be used to meet this requirement, but the range hood must be vented to the outside*. *Re-circulating range hoods cannot be used.*
- The ducting for the exhaust fan shall be sized according to ASHRAE Standard 62.2, Table 7.1 (see item 4). *Flex duct shall not be used in range hood.*

**3)** Local exhaust fans are required to be rated for sound at a maximum of 3 sones for intermittently operated OR maximum of 1 sones for continuous operated.

**4) Whole-Building Ventilation**

In addition to the local exhaust fans in the bathrooms and kitchens, an exhaust fan shall be sized to provide ventilation for the whole house. *Window operation is not a permissible method.*

- The whole-building exhaust fan shall provide a minimum ventilation rate accordance to Equation 4.1(a):

$$Q_{fan} = 0.01\ A_{floor} + 7.5\ (N_{br} + 1)$$

Where $Q_{fan}$ = fan flow rate, (cfm)
$A_{floor}$ = conditioned floor area, $ft^2$
$N_{br}$ = number of bedroom; not to be less than one

- This exhaust fan can be controlled by a standard on/off switch, but the switch MUST be labeled to inform home occupants that it is the whole-building ventilation exhaust fan that is *intended to operate continuously.* This exhaust fan is required to be rated for *sound* at a *maximum* of 1 sone.
- The ducting for the exhaust fan shall be sized according to ASHRAE Standard 62.2, Table 7.1

**5) Prescriptive Duct Sizing Requirements (ASHRAE Standard 62.2 Table 7.1)**

**Table 7.1 Prescriptive Duct Sizing Requirements**

| Duct Type | Flex Duct | | | | Smooth Duct | | | |
|---|---|---|---|---|---|---|---|---|
| Fan Rating (cfm @ 0.25 in. w.c) | 50 | 80 | 100 | 125 | 50 | 80 | 100 | 125 |
| | Maximum Allowable Duct Length (ft) | | | | | | | |
| Diameter, (in) | Flex Duct | | | | Smooth Duct | | | |
| 3 | X | X | X | X | 5 | X | X | X |
| 4 | 70 | 3 | X | X | 105 | 35 | 5 | X |
| 5 | NL | 70 | 35 | 20 | NL | 135 | 85 | 55 |
| 6 | NL | NL | 125 | 95 | NL | NL | NL | 145 |
| 7 and above | NL | NL | NL | NL | NL | NL | NL | NL |

This table assumes no elbows. Deduct 15 ft of allowable duct length for each turn, elbow, or fitting.

NL = no limit on duct length of this size

X = not allowed, any length of duct of this size with assumed turns, elbows, fittings will exceed the rated pressure drop

w.c. = water column

## Required Information on Plans:

A note block should be provided on the plans that identifies a local exhaust ventilation and whole building ventilation.

**1) Local Exhaust Ventilation**

**Bathroom**

□ Specify Bathroom Fan Flow (cfm) = _____;

□ Duct Type = _____ ;

□ Duct Size (in) = _____ and Maximum Allowable Duct Length (ft) = _____;

□ This exhaust fan is required to be rated for *sound* at a *maximum* of 3 sones.

**Kitchen**

□ Specify Kitchen Fan Flow (cfm) = _____;

□ Duct Type = _____ ;

□ Duct Size (in) = _____ and Maximum Allowable Duct Length (ft) = _____;

□ This exhaust fan is required to be rated for *sound* at a *maximum* of 3 sones.

**2) Whole Building Ventilation**

□ Specify Building Fan Flow (cfm) = _____ and Duct Type = _____;

□ Duct Size (in) = _____ and Maximum Allowable Duct Length (ft) = _____;

□ This exhaust fan is required to be rated for *sound* at a *maximum* of 1 sone;

□ This exhaust fan is intended to operate continuously to ensure indoor air quality.

Note: Sone = unit of loudness. Normal talking at 3 feet away ranges from 1 to 4 sones.